

October 7, 2005

Mr. Mark Verhey  
Humboldt County Division of Environmental Health  
100 H Street, Suite 100  
Eureka, California 95501

**Re: Second Quarterly Monitoring Report for June 2005 at  
Blue Lake Forest Products, 1589 Glendale Drive, Arcata, CA  
LOP# 12196**

Dear Mr. Verhey:

On behalf of Blue Lake Forest Products, Winzler & Kelly Consulting Engineers (Winzler & Kelly) is submitting the following quarterly monitoring data collected in June 2005 for the above-referenced site. The purpose of this letter report is to document the activities, results, and findings of the quarterly monitoring program. All figures referred to herein are included in Appendix A. All tables are included in Appendix B, laboratory analytical reports are contained in Appendix C, Standard Operating Procedures (SOP) are contained in Appendix D, and Field Notes are contained in Appendix E.

### **Quarterly Monitoring Activities**

On June 15<sup>th</sup> and 16<sup>th</sup>, 2005 a Winzler & Kelly technician obtained water levels from monitoring wells MW-11, MW-12, MW-13, and MW-14 in order to calculate groundwater gradient. The site monitoring wells were then purged and sampled according to Winzler & Kelly's SOP for "*Monitoring Well Purging and Sampling Activities*" found in Appendix D. During purging, pH, temperature, and specific conductivity readings were also measured. A regional map, site vicinity map, and site map with groundwater gradient and well locations are shown on Figures 1, 2, and 3 respectively (Appendix A).

### **Hydrographic Data**

Depth to water measurements were collected after removing all well caps and allowing the wells to equalize for at least 15 minutes in accordance with Winzler & Kelly's SOP for "*Groundwater Level Measurements and Free Phase Hydrocarbon Measurements*" (Appendix D). Depth to water was measured for each well from the top of the well casing. Depth to water measurements and water groundwater elevations are included in Table 1, Appendix B.

The calculated groundwater gradient using the measurements from the four site monitoring wells during the June 2005 sampling event was similar to previously calculated groundwater gradients for this site. The calculated gradient was 179.90° Azimuth with a magnitude of 1.07 feet per 100 feet. Table 2, Appendix B shows the groundwater gradient summary for the quarterly monitoring events and Figure 3, Appendix A shows the groundwater gradient calculated for the June 2005 sampling event.

Depth to water data for the June 2005 sampling event was submitted electronically to the State Water Resources Control Board Geotracker System on October 3, 2005.

### **Water Sampling**

On June 15<sup>th</sup> and 16<sup>th</sup>, 2005, all four site monitoring wells were purged in accordance with Winzler & Kelly's SOP for "*Monitoring Well Purging and Sampling Activities*" (Appendix D). As standard procedure, measurements of temperature, conductivity, and pH of purge water from each well are made to verify that equilibrium has been attained prior to sampling. After purging at least three wetted casing volumes of water from each monitoring well, water level was allowed to recover to approximately 80% of its pre-purge level before sampling.

During purging and sampling, petroleum odor was noted at MW-13 and petroleum odor and sheen was noted at monitoring well MW-12. Petroleum odor or sheen was not detected in any of the remaining monitoring wells.

As part of the quarterly groundwater monitoring program, groundwater samples collected from site monitoring wells MW-11, MW-12, MW-13 and MW-14 were analyzed for the following:

- Total Petroleum Hydrocarbons as Gasoline (TPH-G) and Benzene, Toluene, Ethylbenzene, and Xylenes, including m,p-Xylene and o-Xylene (BTEX) by EPA Method 5030/8021B.
- Total Petroleum Hydrocarbons as Diesel (TPH-D) and Total Petroleum Hydrocarbons as Motor Oil (TPH-MO) by EPA Method 3510/3630/8015B with silica gel cleanup.

### **Groundwater Analytical Results**

The results of the water sample analyses are summarized in Table 3 in Appendix B. The laboratory reports and chain of custody documentation are included in Appendix C.

Of the four wells sampled, one well contained TPH-D and TPH-G concentrations above laboratory detection limits. The groundwater sample collected from monitoring well MW-12 on June 16, 2005 contained TPH-D and TPH-G at concentrations of 590 parts per billion (ppb) and

56 ppb, respectively. The concentration of TPH-D increased slightly from the March 2005 sampling event when it was reported at 190 ppb. Concentrations of TPH-D and TPH-G have decreased since the first quarterly sampling event in December 2004, when they were reported at 5,700 ppb of TPH-D and 280 ppb of TPH-G. All other tested constituents for MW-12 were below laboratory detection limits.

The groundwater sample collected from well MW-13 was below laboratory detection limits for all tested constituents as they were in the March 2005 sampling event. The December 2004 groundwater sample contained TPH-D and TPH-G at concentrations of 580 ppb and 220 ppb, respectively.

The samples collected from MW-11 and MW-14 were also below the method detection limits for all analytes tested, as they were in the December 2004 sampling event.

Laboratory analytical results for the groundwater samples collected on June 15<sup>th</sup> and 16<sup>th</sup>, 2005 from MW-11, MW-12, MW-13, and MW-14 were submitted electronically to the State Water Resources Control Board Geotracker System on September 12, 2005.

### **Disposition of Soil and Wastewater**

Two 55-gallon drums of purge water are stored at the site. One of the drums holds purge water generated during groundwater sampling of the contaminated wells MW-12 and MW-13. The other drum is storing purge water from the sampling of wells MW-11 and MW-14. When full, the drum containing purged water from the contaminated wells (MW-12 and MW-13) will be disposed of at the City of Eureka's wastewater treatment plant. Arrangements for this disposal will be made when necessary. The drum containing purge water from wells MW-11 and MW-14 will be spray irrigated at the site in a manner that will avoid runoff or ponding.

### **Quality Assurance/Quality Control (QA/QC)**

A trip blank was submitted with the groundwater samples, and all tested constituents were below the detection limits. Laboratory QA/QC was provided by the use of lab Method Blanks to preclude false positive analysis of analytes and the use of Laboratory Control Spike samples (LCS) to evaluate the percentage recovery of target analytes during analysis.

The lab noted:

TPH as Gasoline:

- Sample MW-12 does not present a peak pattern consistent with that of gasoline. The reported result represents the amount of material in the gasoline range.

TPH as Diesel/Motor Oil w/ Silica Gel Cleanup:

- Sample MW-12 contains material similar to degraded or weathered diesel oil.

Mr. Mark Verhey

October 7, 2005

Page 4

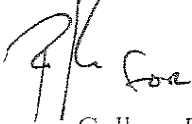
### Conclusions & Recommendations

- The groundwater gradient on June 15, 2005, calculated at 1.07 feet per 100 feet and flowed at 179.90° Azimuth, is consistent with previous calculations.
- Groundwater contaminant levels show a declining trend. Groundwater from MW-12 was the only sample with concentration of contaminants above laboratory detection limits for the June 2005 sampling event. However, the data set is too small to verify any statistical trends.
- The next quarterly monitoring event is scheduled for September 2005.
- The drum containing purge water from wells MW-11 and MW-14 will be spray irrigated at the site in a manner that will avoid runoff or ponding.

If you have any questions or comments, please do not hesitate to call.

Sincerely,  
WINZLER & KELLY

Prepared by:

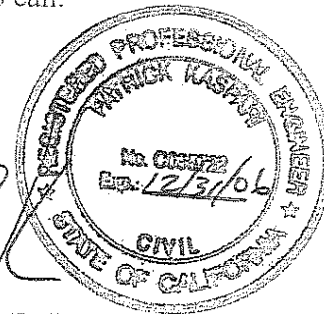


Colleen Ellis  
Staff Geologist

Reviewed by:



Patrick Kaspari, P.E. #C055722  
Project Engineer



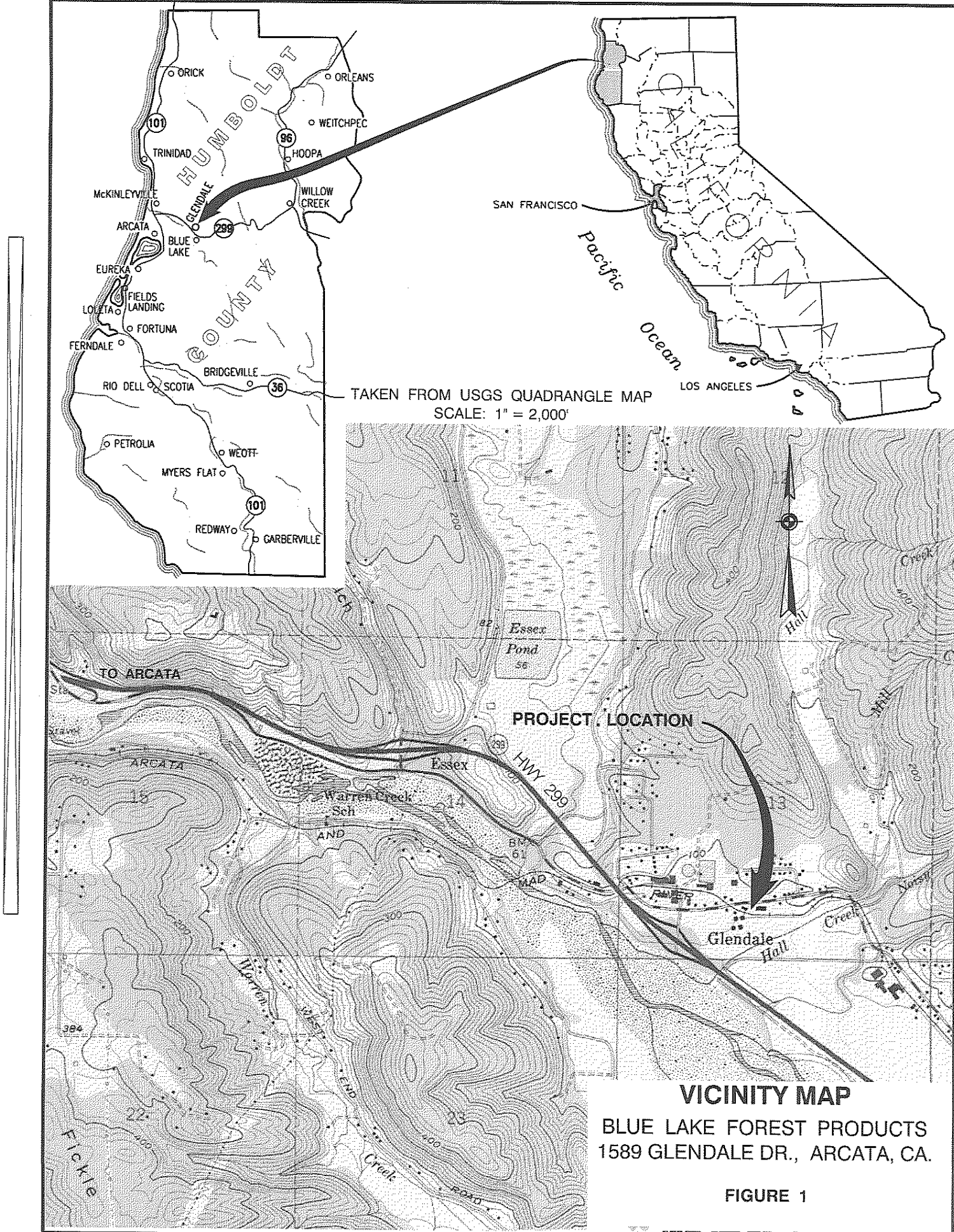
tp

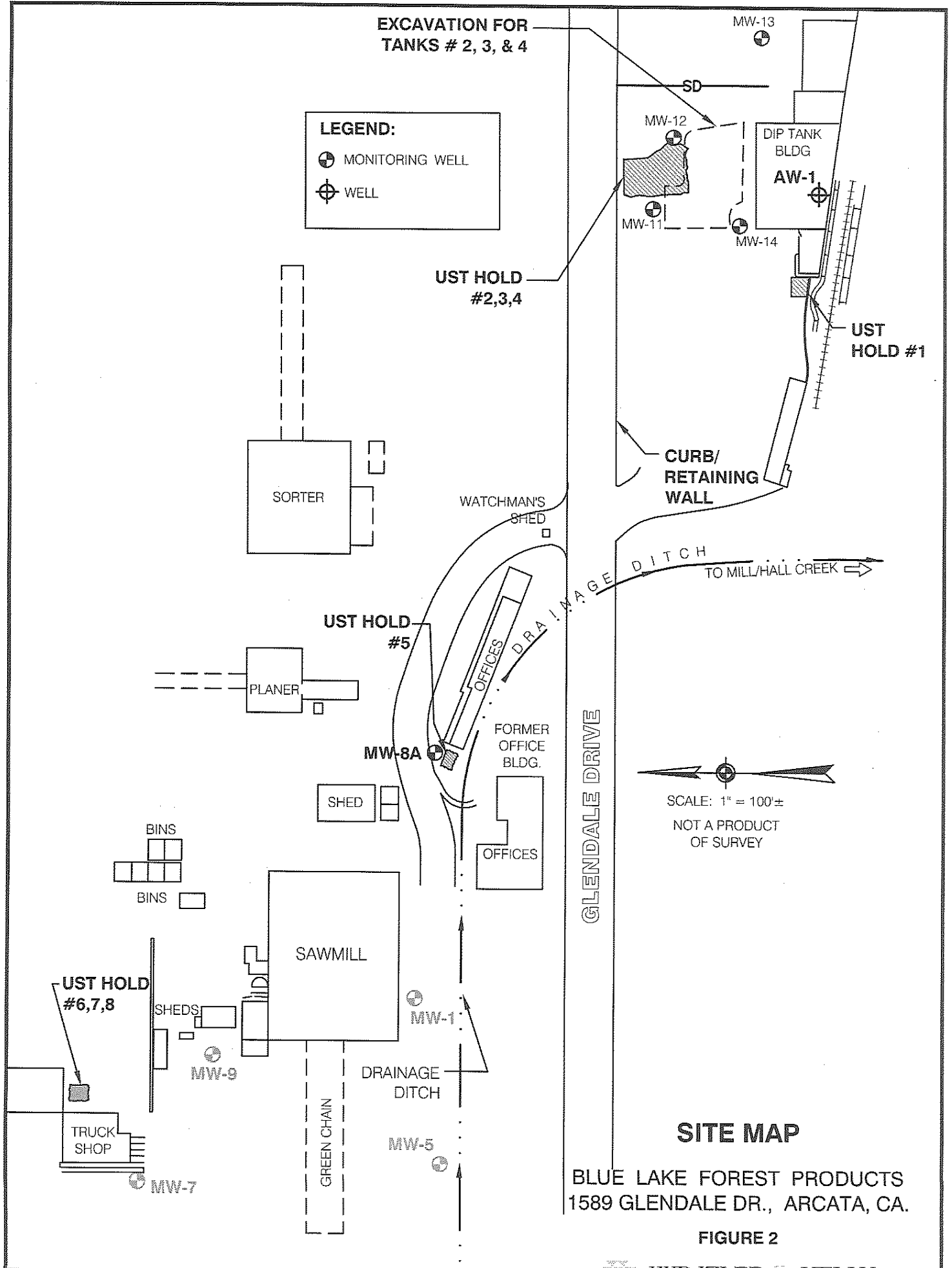
Enclosures:

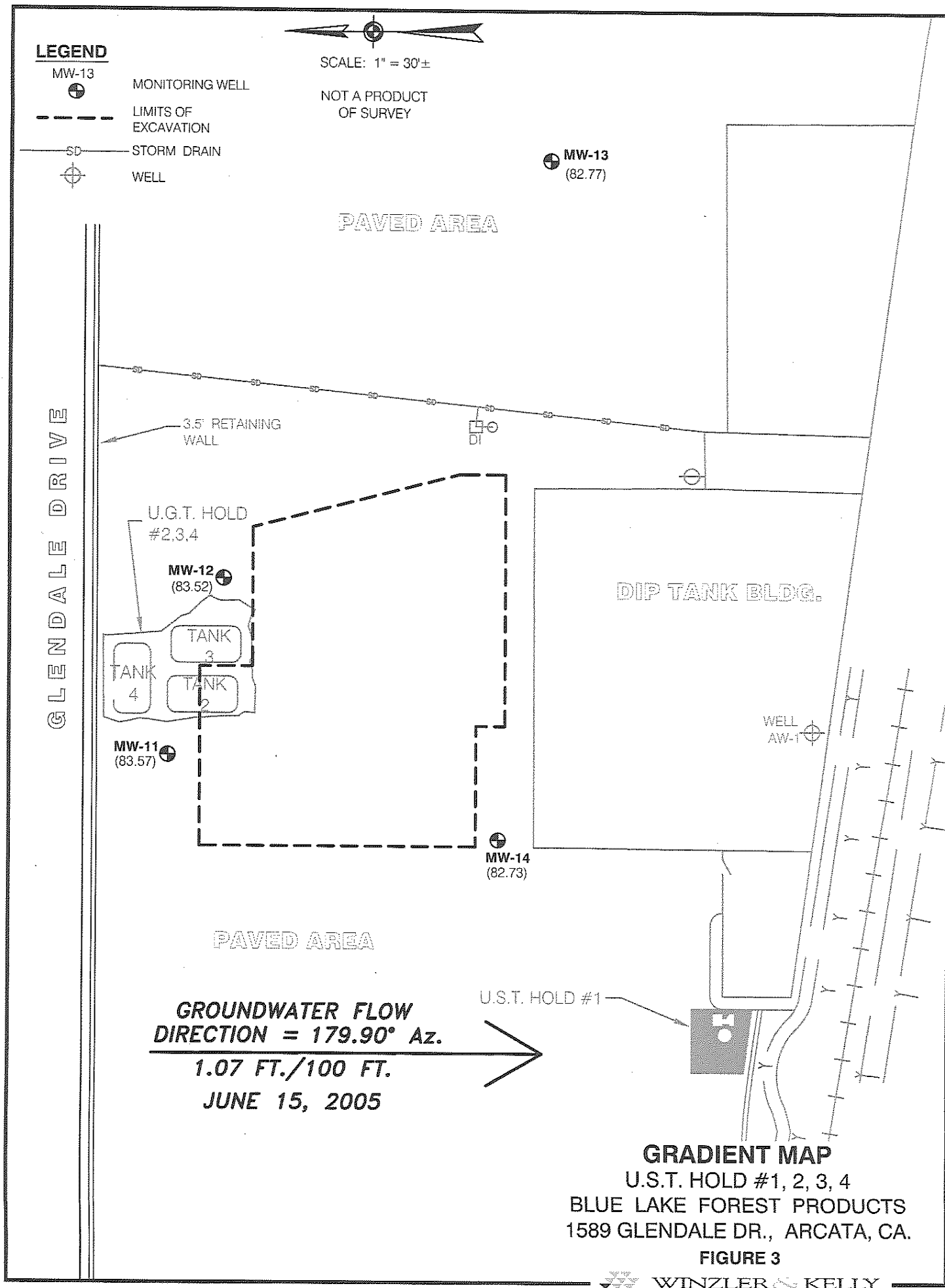
Appendix A:	Figures
Figure 1	Regional Map
Figure 2	Vicinity Map
Figure 3	Site Map with Groundwater Gradient and Well Locations
Appendix B:	Tables
Table 1	Historic Groundwater Measurements
Table 2	Groundwater Gradient Summary
Table 4	Quarterly Groundwater Analytical Results
Appendix C:	Laboratory Analytical Reports
Appendix D:	Standard Operating Procedures
Appendix E:	Field Notes

c: Dan Aalfs, P.O. Box 2159, McKinleyville, CA 95519  
Gary Johnston, 1325 G Street, Eureka, CA 95501













**TABLE 1**  
**GROUNDWATER ELEVATION**  
BLUE LAKE FOREST PRODUCTS

Monitoring Well ID	MW-11		MW-12		MW-13		MW-14	
	northing	easting	northing	easting	northing	easting	northing	easting
Well Location	40.89993	-124.01589	40.89991	-124.01738	40.89973	-124.01534	40.89970	-124.01593
Top of Casing (ft MSL)	91.47		91.52		91.19		91.71	
DATE	DTW	GW ELEV	DTW	GW ELEV	DTW	GW ELEV	DTW	GW ELEV
	(ft bgs)	(ft MSL)	(ft bgs)	(ft MSL)	(ft bgs)	(ft MSL)	(ft bgs)	(ft MSL)
	10.28	81.19	10.49	81.03	11.00	80.19	11.59	80.12
2-Dec-04	6.63	34.27	6.64	34.26	6.92	33.98	8.38	32.52
26-Mar-05	7.90	83.57	8.00	83.52	8.42	82.77	8.98	82.73
15-Jun-05								

**TABLE 2**  
**GROUNDWATER GRADIENT**  
 BLUE LAKE FOREST PRODUCTS

<i>Date of Data Collection</i>	<i>Groundwater Flow Direction</i>	<i>Degrees Azimuth</i>	<i>Slope in Feet Per 100 Feet</i>
2-Dec-04	south	179.88	1.29
26-Mar-05	south	196.35	1.85
15-Jun-05	south	179.90	1.07

**TABLE 3**  
**GROUNDWATER ANALYTICAL RESULTS**  
BLUE LAKE FOREST PRODUCTS

Sample	Date	TPH-Diesel (ppb)	TPH-MO (ppb)	TPH-Gas (ppb)	MTBE Methyl tert-butyl ether (ppb)	TBA Tert-butyl alcohol	DIPE Di-isopropyl ether	ETBE Ethyl tert-butyl ether	TAME Tert-amyl methyl ether	Benzene (ppb)	Toluene (ppb)	Ethyl- Benzene (ppb)	m,p Xylene (ppb)	"o" Xylene (ppb)	Lead (ppb)
MW-11	12/2/04	< 50 <sup>2</sup>	NT	< 50	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 5
	3/26/05	< 50	< 170	< 50	< 3.0	NT	NT	NT	NT	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	NT
	6/15/05	< 50	< 170	< 50	< 3.0	NT	NT	NT	NT	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	NT
MW-12	12/3/04	5700 <sup>1,2</sup>	NT	280 <sup>3</sup>	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 5
	3/26/05	190 <sup>1</sup>	< 170	72 <sup>3</sup>	< 3.0	NT	NT	NT	NT	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	NT
	6/16/05	590 <sup>1</sup>	< 170	56 <sup>3</sup>	< 3.0	NT	NT	NT	NT	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	NT
	12/3/04	580 <sup>1,2</sup>	NT	220 <sup>3</sup>	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 5
MW-13	3/26/05	< 50	< 170	< 50	< 3.0	NT	NT	NT	NT	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	NT
	6/16/05	< 50	< 170	< 50	< 3.0	NT	NT	NT	NT	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	NT
MW-14	12/3/04	< 50 <sup>2</sup>	NT	< 50	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 5
	3/26/05	< 50	< 170	< 50	< 3.0	NT	NT	NT	NT	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	NT
	6/15/05	< 50	< 170	< 50	< 3.0	NT	NT	NT	NT	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	NT

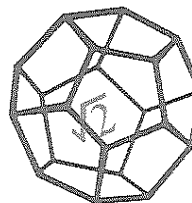
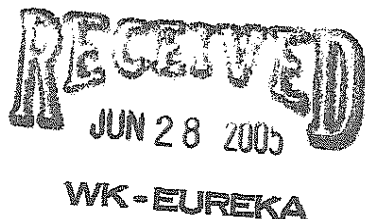
**Notes:**

- 1 Sample contains material similar to degraded or weathered diesel oil.
- 2 The laboratory control sample (LCS) and the laboratory control sample duplicate (LCSD) recoveries were above the upper acceptance limit for diesel. These recoveries indicate that the sample results may be erroneously high. There were no detectable levels of the analyte in the samples; therefore, the data were accepted.
- 3 Samples do not present a peak pattern consistent with that of gasoline. The peaks elute toward the end of the gasoline range. The material appears to be a product heavier than gasoline. The reported results represent the amount of material in the gasoline range.

---

## **Appendix C**

### **Laboratory Analytical Reports**



**NORTH COAST  
LABORATORIES LTD.**

June 28, 2005

Winzler and Kelly  
633 Third Street  
Eureka, CA 95501

Order No.: 0506438  
Invoice No.: 51055  
PO No.:  
ELAP No. 1247-Expires July 2006

Attn: Colleen Ellis

RE: 00142803 206, BLFP 2nd QMR 2005

**SAMPLE IDENTIFICATION**

Fraction      Client Sample Description

01A	MW-11
01D	MW-11
02A	MW-12
02D	MW-12
03A	MW-13
03D	MW-13
04A	MW-14
04D	MW-14

ND = Not Detected at the Reporting Limit

Limit = Reporting Limit

All solid results are expressed on a wet-weight basis unless otherwise noted.

**REPORT CERTIFIED BY**

Laboratory Supervisor(s)

QA Unit

Jesse G. Chaney, Jr.  
Laboratory Director

**CLIENT:** Winzler and Kelly  
**Project:** 00142803 206, BLFP 2nd QMR 2005  
**Lab Order:** 0506438

**CASE NARRATIVE**

All samples submitted for a silica gel cleanup were initially analyzed for diesel/motor oil. The samples showing no detectable levels of the analytes were not subjected to the cleanup procedure.

TPH as Diesel/Motor Oil w/Silica Gel Cleanup:

Sample MW-12 contains material similar to degraded or weathered diesel oil.

TPH as Gasoline:

Sample MW-12 does not present a peak pattern consistent with that of gasoline. The reported result represents the amount of material in the gasoline range.



Date: 28-Jun-05  
WorkOrder: 0506438

## ANALYTICAL REPORT

Client Sample ID: MW-11  
Lab ID: 0506438-01A

Received: 6/16/05

Collected: 6/15/05 17:29

Test Name: BTEX

Reference: EPA 5030/EPA 8021B

<u>Parameter</u>	<u>Result</u>	<u>Limit</u>	<u>Units</u>	<u>DF</u>	<u>Extracted</u>	<u>Analyzed</u>
MTBE	ND	3.0	µg/L	1.0		6/26/05
Benzene	ND	0.50	µg/L	1.0		6/26/05
Toluene	ND	0.50	µg/L	1.0		6/26/05
Ethylbenzene	ND	0.50	µg/L	1.0		6/26/05
m,p-Xylene	ND	0.50	µg/L	1.0		6/26/05
o-Xylene	ND	0.50	µg/L	1.0		6/26/05
Surrogate: Cis-1,2-Dichloroethylene	103	85-115	% Rec	1.0		6/26/05

Test Name: TPH as Gasoline

Reference: EPA 5030/GCFID(LUFT)/EPA 8015B

<u>Parameter</u>	<u>Result</u>	<u>Limit</u>	<u>Units</u>	<u>DF</u>	<u>Extracted</u>	<u>Analyzed</u>
TPHC Gas (C6-C14)	ND	50	µg/L	1.0		6/26/05

Client Sample ID: MW-11  
Lab ID: 0506438-01D

Received: 6/16/05

Collected: 6/15/05 17:29

Test Name: TPH as Diesel/Motor Oil

Reference: EPA 3510/GCFID(LUFT)/EPA 8015B

<u>Parameter</u>	<u>Result</u>	<u>Limit</u>	<u>Units</u>	<u>DF</u>	<u>Extracted</u>	<u>Analyzed</u>
TPHC Diesel (C12-C22)	ND	50	µg/L	1.0	6/18/05	6/21/05
TPHC Motor Oil	ND	170	µg/L	1.0	6/18/05	6/21/05

Client Sample ID: MW-12  
Lab ID: 0506438-02A

Received: 6/16/05

Collected: 6/16/05 12:30

Test Name: BTEX

Reference: EPA 5030/EPA 8021B

<u>Parameter</u>	<u>Result</u>	<u>Limit</u>	<u>Units</u>	<u>DF</u>	<u>Extracted</u>	<u>Analyzed</u>
MTBE	ND	3.0	µg/L	1.0		6/26/05
Benzene	ND	0.50	µg/L	1.0		6/26/05
Toluene	ND	0.50	µg/L	1.0		6/26/05
Ethylbenzene	ND	0.50	µg/L	1.0		6/26/05
m,p-Xylene	ND	0.50	µg/L	1.0		6/26/05
o-Xylene	ND	0.50	µg/L	1.0		6/26/05
Surrogate: Cis-1,2-Dichloroethylene	89.1	85-115	% Rec	1.0		6/26/05

Test Name: TPH as Gasoline

Reference: EPA 5030/GCFID(LUFT)/EPA 8015B

<u>Parameter</u>	<u>Result</u>	<u>Limit</u>	<u>Units</u>	<u>DF</u>	<u>Extracted</u>	<u>Analyzed</u>
TPHC Gas (C6-C14)	56	50	µg/L	1.0		6/26/05



Date: 28-Jun-05  
WorkOrder: 0506438

## ANALYTICAL REPORT

Client Sample ID: MW-12  
Lab ID: 0506438-02D

Received: 6/16/05

Collected: 6/16/05 12:30

Test Name: TPH as Diesel/Motor Oil w/ Silica Gel Cleanup Reference: EPA 3510/3630/GCFID(LUFT)/8015B

<u>Parameter</u>	<u>Result</u>	<u>Limit</u>	<u>Units</u>	<u>DF</u>	<u>Extracted</u>	<u>Analyzed</u>
TPHC Diesel (C12-C22)	590	50	µg/L	1.0	6/22/05	6/27/05
TPHC Motor Oil	ND	170	µg/L	1.0	6/22/05	6/27/05

Client Sample ID: MW-13  
Lab ID: 0506438-03A

Received: 6/16/05

Collected: 6/16/05 12:15

Test Name: BTEX

Reference: EPA 5030/EPA 8021B

<u>Parameter</u>	<u>Result</u>	<u>Limit</u>	<u>Units</u>	<u>DF</u>	<u>Extracted</u>	<u>Analyzed</u>
MTBE	ND	3.0	µg/L	1.0		6/26/05
Benzene	ND	0.50	µg/L	1.0		6/26/05
Toluene	ND	0.50	µg/L	1.0		6/26/05
Ethylbenzene	ND	0.50	µg/L	1.0		6/26/05
m,p-Xylene	ND	0.50	µg/L	1.0		6/26/05
o-Xylene	ND	0.50	µg/L	1.0		6/26/05
Surrogate: Cis-1,2-Dichloroethylene	89.9	85-115	% Rec	1.0		6/26/05

Test Name: TPH as Gasoline

Reference: EPA 5030/GCFID(LUFT)/EPA 8015B

<u>Parameter</u>	<u>Result</u>	<u>Limit</u>	<u>Units</u>	<u>DF</u>	<u>Extracted</u>	<u>Analyzed</u>
TPHC Gas (C6-C14)	ND	50	µg/L	1.0		6/26/05

Client Sample ID: MW-13  
Lab ID: 0506438-03D

Received: 6/16/05

Collected: 6/16/05 12:15

Test Name: TPH as Diesel/Motor Oil

Reference: EPA 3510/GCFID(LUFT)/EPA 8015B

<u>Parameter</u>	<u>Result</u>	<u>Limit</u>	<u>Units</u>	<u>DF</u>	<u>Extracted</u>	<u>Analyzed</u>
TPHC Diesel (C12-C22)	ND	50	µg/L	1.0	6/18/05	6/21/05
TPHC Motor Oil	ND	170	µg/L	1.0	6/18/05	6/21/05



Date: 28-Jun-05  
WorkOrder: 0506438

## ANALYTICAL REPORT

Client Sample ID: MW-14  
Lab ID: 0506438-04A

Received: 6/16/05

Collected: 6/15/05 17:01

Test Name: BTEX

Reference: EPA 5030/EPA 8021B

<u>Parameter</u>	<u>Result</u>	<u>Limit</u>	<u>Units</u>	<u>DF</u>	<u>Extracted</u>	<u>Analyzed</u>
MTBE	ND	3.0	µg/L	1.0		6/26/05
Benzene	ND	0.50	µg/L	1.0		6/26/05
Toluene	ND	0.50	µg/L	1.0		6/26/05
Ethylbenzene	ND	0.50	µg/L	1.0		6/26/05
m,p-Xylene	ND	0.50	µg/L	1.0		6/26/05
o-Xylene	ND	0.50	µg/L	1.0		6/26/05
Surrogate: Cis-1,2-Dichloroethylene	95.7	85-115	% Rec	1.0		6/26/05

Test Name: TPH as Gasoline

Reference: EPA 5030/GCFID(LUFT)/EPA 8015B

<u>Parameter</u>	<u>Result</u>	<u>Limit</u>	<u>Units</u>	<u>DF</u>	<u>Extracted</u>	<u>Analyzed</u>
TPHC Gas (C6-C14)	ND	50	µg/L	1.0		6/26/05

Client Sample ID: MW-14  
Lab ID: 0506438-04D

Received: 6/16/05

Collected: 6/15/05 17:01

Test Name: TPH as Diesel/Motor Oil w/ Silica Gel Cleanup

Reference: EPA 3510/3630/GCFID(LUFT)/8015B

<u>Parameter</u>	<u>Result</u>	<u>Limit</u>	<u>Units</u>	<u>DF</u>	<u>Extracted</u>	<u>Analyzed</u>
TPHC Diesel (C12-C22)	ND	50	µg/L	1.0	6/22/05	6/27/05
TPHC Motor Oil	ND	170	µg/L	1.0	6/22/05	6/27/05



# North Coast Laboratories, Ltd.

Date: 28-Jun-05

CLIENT: Winzler and Kelly

Work Order: 0506438

Project: 00142803 206, BLFP 2nd QMR 2005

## QC SUMMARY REPORT

Method Blank

Sample ID	MB-6/26/05	Batch ID: R35556	Test Code: BTXEW	Units: µg/L	Analysis Date	6/26/05 6:51:00 PM	Prep Date				
Client ID:		Run ID: ORGC8_050626B	SeqNo: 513214								
Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
MTBE	ND	3.0									
Benzene	ND	0.50									
Toluene	ND	0.50									
Ethylbenzene	ND	0.50									
m,p-Xylene	ND	0.50									
o-Xylene	ND	0.50									
Cis-1,2-Dichloroethylene	0.909	0.10	1.00	0	90.9%	85	115	0			

Sample ID	MB-13709	Batch ID: 13709	Test Code: SGTPDMW	Units: µg/L	Analysis Date	6/27/05 1:21:53 PM	Prep Date	6/22/05			
Client ID:		Run ID: ORGC5_050627A	SeqNo: 513322								
Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Diesel (C12-C22)	43.03	50									J
TPHC Motor Oil	29.17	170									J

Sample ID	MB-6/26/05	Batch ID: R35554	Test Code: TPHCGW	Units: µg/L	Analysis Date	6/26/05 6:51:00 PM	Prep Date				
Client ID:		Run ID: ORGC8_050626A	SeqNo: 513203								
Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Gas (C6-C14)	ND	50									

Sample ID	MB-13688	Batch ID: 13688	Test Code: TPHDMW	Units: µg/L	Analysis Date	6/21/05 12:06:16 PM	Prep Date	6/18/05			
Client ID:		Run ID: ORGC7_050621B	SeqNo: 512431								
Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Diesel (C12-C22)	40.92	50									J
TPHC Motor Oil	81.35	170									J

Qualifiers: ND - Not Detected at the Reporting Limit  
J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits  
R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

## North Coast Laboratories, Ltd.

Date: 28-Jun-05

CLIENT: Winzler and Kelly

Work Order: 0506438

Project: 00142803 206, BLFP 2nd QMR 2005

## QC SUMMARY REPORT

Laboratory Control Spike

Sample ID	LCS-05412	Batch ID: R35556	Test Code: BTXEW	Units: µg/L	Analysis Date	6/26/05 3:53:34 PM	Prep Date				
Client ID:		Run ID:	ORGC8_050626B		SeqNo:	513212					
Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
MTBE	40.54	3.0	40.0	0	101%	85	115	0			
Benzene	4.975	0.50	5.00	0	99.5%	85	115	0			
Toluene	4.866	0.50	5.00	0	97.3%	85	115	0			
Ethylbenzene	4.875	0.50	5.00	0	97.5%	85	115	0			
m,p-Xylene	9.749	0.50	10.0	0	97.5%	85	115	0			
o-Xylene	4.863	0.50	5.00	0	97.3%	85	115	0			
Cis-1,2-Dichloroethylene	1.05	0.10	1.00	0	105%	85	115	0			

Sample ID	LCSD-05412	Batch ID: R35556	Test Code: BTXEW	Units: µg/L	Analysis Date 6/27/05 1:54:13 AM				Prep Date		
Client ID:		Run ID:	ORGC8_050626B		SeqNo:	513221					
Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
MTBE	37.29	3.0	40.0	0	93.2%	85	115	40.5	8.34%	15	
Benzene	4.748	0.50	5.00	0	95.0%	85	115	4.97	4.65%	15	
Toluene	4.620	0.50	5.00	0	92.4%	85	115	4.87	5.19%	15	
Ethylbenzene	4.698	0.50	5.00	0	94.0%	85	115	4.88	3.70%	15	
m,p-Xylene	9.333	0.50	10.0	0	93.3%	85	115	9.75	4.37%	15	
o-Xylene	4.678	0.50	5.00	0	93.6%	85	115	4.86	3.88%	15	
Cis-1,2-Dichloroethylene	1.12	0.10	1.00	0	112%	85	115	1.05	6.33%	15	

Sample ID	LCS-13709	Batch ID: 13709	Test Code: SGTPDMW	Units: µg/L	Analysis Date	6/27/05 11:11:36 AM	Prep Date	6/22/05			
Client ID:		Run ID: ORGC5_050627A			SeqNo: 513320						
Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Diesel (C12-C22)	363.2	50	500	0	72.6%	42	96	0			
TPHC Motor Oil	953.7	170	1 000	0	95.4%	52	103	0			

## Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

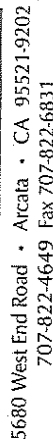
**CLIENT:** Winzler and Kelly  
**Work Order:** 0506438  
**Project:** 00142803 206, BLFP 2nd QMR 2005

# QC SUMMARY REPORT

Laboratory Control Spike Duplicate

Sample ID		LCSD-13709		Batch ID: 13709		Test Code: SGTPDMW		Units: µg/L		Analysis Date		6/27/05 11:44:31 AM		Prep Date		6/22/05	
Client ID:				Run ID:		ORGC5_050627A				SeqNo:		513321					
Analyte		Result		Limit		SPK value		SPK Ref Val		% Rec		LowLimit		HighLimit		RPD Ref Val	
TPHC Diesel (C12-C22)		343.0		50		500		0		68.6%		42		96		363	
TPHC Motor Oil		879.9		170		1,000		0		88.0%		52		103		954	
TPHC Motor Oil																15	
TPHC Motor Oil																15	
Sample ID		LCS-05413		Batch ID: R35554		Test Code: TPHCGW		Units: µg/L		Analysis Date		6/26/05 5:04:37 PM		Prep Date			
Client ID:				Run ID:		ORGC8_050626A				SeqNo:		513201					
Analyte		Result		Limit		SPK value		SPK Ref Val		% Rec		LowLimit		HighLimit		RPD Ref Val	
TPHC Gas (C6-C14)		507.6		50		500		0		102%		81		126		0	
TPHC Gas (C6-C14)																	
Sample ID		LCSD-05413		Batch ID: R35554		Test Code: TPHCGW		Units: µg/L		Analysis Date		6/27/05 2:29:21 AM		Prep Date			
Client ID:				Run ID:		ORGC8_050626A				SeqNo:		513209					
Analyte		Result		Limit		SPK value		SPK Ref Val		% Rec		LowLimit		HighLimit		RPD Ref Val	
TPHC Gas (C6-C14)		490.5		50		500		0		98.1%		81		126		508	
TPHC Gas (C6-C14)																15	
TPHC Gas (C6-C14)																	
Sample ID		LCS-13688		Batch ID: 13688		Test Code: TPHDMW		Units: µg/L		Analysis Date		6/21/05 10:04:49 AM		Prep Date		6/18/05	
Client ID:				Run ID:		ORGC7_050621B				SeqNo:		512428					
Analyte		Result		Limit		SPK value		SPK Ref Val		% Rec		LowLimit		HighLimit		RPD Ref Val	
TPHC Diesel (C12-C22)		498.6		50		500		0		99.7%		72		124		0	
TPHC Motor Oil		1,038		170		1,000		0		104%		71		139		0	
TPHC Motor Oil																	
Sample ID		LCSD-13688		Batch ID: 13688		Test Code: TPHDMW		Units: µg/L		Analysis Date		6/21/05 10:25:04 AM		Prep Date		6/18/05	
Client ID:				Run ID:		ORGC7_050621B				SeqNo:		512429					
Analyte		Result		Limit		SPK value		SPK Ref Val		% Rec		LowLimit		HighLimit		RPD Ref Val	
TPHC Diesel (C12-C22)		522.3		50		500		0		104%		72		124		499	
TPHC Motor Oil		1,090		170		1,000		0		109%		71		139		1,040	
TPHC Motor Oil																15	
TPHC Motor Oil																15	

**Qualifiers:**
ND - Not Detected at the Reporting Limit
S - Spike Recovery outside accepted recovery limits
B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits
R - RPD outside accepted recovery limits



٥٠

**CHAIN OF CUSTODY SEALS Y/N/NA** 

**SHIPPED VIA:** UPS   Air-Ex   Fed-Ex   Bus   Hand

**ALL CONTAMINATED NON-AQUEOUS SAMPLES WILL BE RETURNED TO CLIENT**



---

## WINZLER & KELLY CONSULTING ENGINEERS

---

### STANDARD OPERATING PROCEDURES for MONITOR WELL PURGING AND SAMPLING ACTIVITIES

---

#### 1.0 OBJECTIVE

To establish accepted procedures for the purging and sampling groundwater from monitoring wells, to ensure that representative samples of formation water are collected by accepted methods.

#### 1.1 Background

To obtain a representative groundwater sample from monitor wells, it is necessary to remove (purge) stagnant water from within and near the well prior to sampling. In general, three to seven casing volumes must be removed from the well prior to sampling, to provide a representative sample. Wells may be sampled after purging less than the minimum three volumes if well recharge rates are beyond reasonable time constraints. The specific method of well purging will be decided on a case by case basis, or as required by project specifications.

#### 1.2 Personnel Required and Responsibilities

Project Manager: The Project Manager (PM) is responsible for ensuring that field personnel have been trained in the use of these procedures and for verifying that monitoring well purging and sampling activities are performed in compliance with these SOP's.

Field Technician: The Field Technician is responsible for complying with these SOP's, including the purging and sampling of monitor wells, the safe containerization of extracted waters, the documentation of field procedures, and the handling of samples..

#### 2.0 WELL PURGING ACTIVITIES

##### 2.1 Equipment Required

- Bottom-filling bailer, suction air pump, air-lift pump, gas operated (bladder) pump, submersible pump, or other pumping device
- pH meter
- Conductivity/Temperature Meter
- Water Level Indicator
- Well Sampling Data Sheet
- Indelible marker
- Disposable gloves
- Containers to hold extracted water (as required)



## 2.2. Purging Procedure

Prior to groundwater sampling, each monitoring well will be purged as described below. Prior to insertion into each well, all equipment will be either decontaminated (following W&K Decontamination procedures) or will be deemed clean or previously unused by the manufacturer.

- Open all monitoring wells to be purged and allow to equilibrate 5 to 15 minutes. Record time and visual observations regarding well access, condition, security, etc. in log book.
- Obtain depth to groundwater level readings according to Winzler & Kelly Standard Operating Procedures for Groundwater Level measurements and Free Phase Hydrocarbon Measurements. Record time and readings on the Well Level Measurement Data Sheet.
- Calculate the volume of standing water in each monitoring well. Record the volume calculated for each well on the Well Sampling Data Sheet.
- Begin purging the well by removing water from the well and collecting in a calibrated container (i.e., 5-gallon bucket marked in 1-gallon increments). The depth, or interval, from which the water is being purged should be noted on the data sheet.
- Obtain readings of field parameters (pH, conductivity, temperature, and turbidity) and make visual observations of color/odor/turbidity at selected intervals (i.e., every gallon, every five gallons, etc.) throughout the purging process. Depending on the calculated volume and the expected number of gallons to be purged, a minimum of five readings should be collected. Record the time, readings, and visual comments on the Purge Data Sheet.
- Continue purging until at least three (minimum) to four well volumes have been removed and the field parameters stabilize to within:

pH	~0.1
conductivity	~10%
turbidity	~10%
temperature	~1°
- Do not exceed seven well volumes.
- Obtain a final depth to groundwater level measurement prior to collection of the groundwater sample and note the reading and time on the Well Level Measurement Data Sheet. Be sure that the measurement probe has been thoroughly decontaminated prior to insertion into each well. Note any qualitative comments regarding recharge rate of each well, and calculate the percent of the original water column that has recovered at the time of the final depth measurement. It is ideal to attain a minimum of 80% water level recovery prior to sampling, if time constraints allow. Very slow recharge rates may not allow purging the minimum three volumes or 80% recovery; lesser volumes may be used for sampling, as needed and documented.
- Collect a groundwater sample following the directions below under Section 3.0.

- Containerize all purge water and decontamination water in 55-gallon drums. Use yellow indelible markers (storeroom supply) to label all drums on the side with date, contents, origin and other pertinent information. Avoid marking the tops of drums with black marker, such marks are temporary and will soon fade/rust. Note the number, condition and location of drums on site in the field notes.

### 3.0 WELL SAMPLING ACTIVITIES

#### 3.1 Equipment Required

- Disposable bailer (previously unused) \*
- Bottom emptying device (sampling port)
- Monofilament nylon line (min 40-lb test)
- Monitor Well Purge & Sample Data Sheets
- Sample containers (preserved, as required) - provided by the laboratory
- Sample labels
- Indelible marker
- Disposal gloves
- Decontamination soap (Alconox)
- Distilled water for equipment decontamination.

\*A variety of sampling techniques are available for the collection of groundwater samples. Except where otherwise required, W&K only utilizes disposable polyethylene bailers to collect groundwater samples.

#### 3.2. Sampling Procedure

Prior to collecting a groundwater sample from a monitoring well, each well must be properly purged in accordance with W&K's SOP for Monitoring Well Purging Activities (See Section 2.0 above), including the measurement of the final water level and documentation of recharge.

- Water from the desired screen interval will be collected by lowering the previously unused disposable, polyethylene, bottom-filling bailer into the well.
- When bailer is completely full, carefully retract the bailer from the well casing.
- Using a previously unused, new, bottom-emptying device, to minimize agitation of the water, transfer the water from the bailer to the sample containers.
- When sampling for volatile constituents (VOA's), the water samples will be collected in 40-ml glass vials (preserved as required by the analyses requested). Precautions will be taken to prevent capturing air bubbles in the vials.
- Upon filling, each vial will be immediately capped with a Teflon septum and plastic screw cap. The vial will be checked for air bubbles by inverting and gently tapping the vial. If any bubbles are visible, the vial will be refilled and confirmed to be free of any air bubbles.

- At a minimum, all samples will be labeled with the following information:  
 Sample ID                      Date and Time Sample Collected  
 Location                        Sampler's Initials  
 Project Number                Analyses Requested
- Sample information will be documented on the Chain-of-Custody form.  
 All samples will be placed in an ice chest, chilled to a temperature of 4°C. The ice chest will remain in the custody of the sampler until it is transferred to the courier service for delivery at the analytical laboratory for analyses. Any and all transfer of sample custody must be documented on the Chain-of-Custody form with the name, signature, affiliation, date and time of the persons releasing and receiving custody of the samples.
- Upon completion of the sampling activities, each well shall be closed and secured by replacing the well cap and securing the lock.
- Dispose of gloves, bailers, bottom-emptying devices, and bailing line after each use.

# WINZLER & KELLY CONSULTING ENGINEERS

---

## STANDARD OPERATING PROCEDURES GROUNDWATER LEVEL MEASUREMENTS AND FREE PHASE HYDROCARBON MEASUREMENTS

---

### 1. Objective

To establish accepted procedures for detecting free-phase hydrocarbons and measuring groundwater levels in monitoring wells.

### 2. Background

Any time water levels are required to determine the groundwater flow gradient or flow direction, water levels are collected. Wells are tested for free-phase hydrocarbons prior to insertion of electronic water level probes or purge pumps the first time a well is sampled and in any well that has a history of free-phase hydrocarbons.

### 3. Personnel Required and Responsibilities

Project Manager: The Project Manager (PM) is responsible for ensuring that field personnel have been trained in these procedures and for verifying that water levels have been collected in compliance with this SOP.

Field Technician: The Field Technician is responsible for complying with this SOP, including determining if there are free phase hydrocarbons in the well, the thickness (if it exists) and the stabilized water level in the well.

### 4. Equipment Required

- Water level/free phase hydrocarbon indicator probe or pastes
- Tape measure
- Water Level Data Form/pencil
- Watch
- Disposable gloves
- Distilled water
- Alconox soap
- Containers to hold rinsate water
- Site Safety Plan and Hospital Map
- Keys to wells
- Tools to open wells

### 5. Procedure

After reviewing the Site Safety Plan and determining the type and concentrations of contaminants that may be present on site, the field personnel will don the proper level of personal protection prior to opening any wells.

Open all monitoring wells to be measured and remove expandable caps. Allow wells to equilibrate 5 to 15 minutes. Record time and visual observations regarding well access, condition, security, etc on water level data sheet.

**5a. Alternative procedure for electronic water-level/free-phase hydrocarbon indicator**

- Decontaminate probe with potable water and Alconox mix. Rinse with distilled water.
- Lower probe into the well and determine the presence of any free-phase hydrocarbons. The probe will emit a continuous sound if free product is present. If no product is present, the probe will make an oscillating (beeping) sound when it encounters water. Record the depth of free-phase hydrocarbons on the water level data sheet. If no free-phase hydrocarbons are present, record the water depth. **DO NOT SUBMERGE THE PROBE THROUGH THE FLOATING PRODUCT LAYER.**
- Gradient calculations shall then be performed by calculation of the groundwater elevation by:
  - $GW\ ELEV = (TOC) - (\text{depth to water})$ .
  - TOC indicates top of casing elevation as surveyed.
  - If free-phase hydrocarbons are indicated, determine the depth to water using a steel measuring tape and water indicator paste, by the procedure below.

**5b. Alternative procedure for product and water indicator pastes**

- Decontaminate tape measure.
- Place **product** indicator paste on bottom two feet of tape measure.
- Lower tape measure into well. Note depth to which the end of the tape is lowered relative to the point of survey mark on the top of the well casing.
- Withdraw the tape. If paste has changed color, free-phase hydrocarbons are present. Calculate depth to the floating layer by:
  - $\text{Depth to Product} = (\text{depth to which tape lowered into well}) - (\text{length of product indicator paste discoloration})$ .
- Remove product indicator paste with paper towel and decontaminate tape measure.
- Apply **water** indicator paste on bottom two feet of tape measure.
- Lower tape into well. Note depth to which end of tape is lowered.
- Withdraw the tape. Calculate the depth to water by:
  - $\text{Depth to Water} = (\text{depth to which tape lowered into well}) - (\text{length of water indicator paste discoloration})$ .
- Obtain the depth to groundwater level readings from the point of survey mark, or from the North side of the top of the casing, if no point of survey mark is present. Readings will be measured to the nearest 0.01 foot. Note time and readings on water level data sheet.
- Use the same measuring device to measure water levels in all wells to be used in the gradient calculation.

- Obtain depth to casing bottom for each well by submerging a tape measure until it reaches the bottom of the well. Readings will be measured to the nearest 0.01 foot. Note readings on data sheet. If sampling is not going to be completed at the site, close and lock all wells.
- Gradient calculations shall then be conducted by making water depth corrections for the presence of free product. First calculate the product thickness:
  - $\text{Product Thickness} = (\text{Depth to Water}) - (\text{Depth to Product})$ .
  - Water elevations when free product is present shall then be calculated by:
  - $\text{GW ELEV} = (\text{TOC}) - (\text{Depth to Water}) - \text{SG}_{\text{product}} (\text{Product Thickness})$
  - On any site where monitoring will occur more than once, a free product sample will be collected and measured for specific gravity ( $\text{SG}_{\text{product}}$ ). In the absence of the site specific free product specific gravity  $\text{SG}_{\text{product}}$  shall be assumed to be 0.78.



TODAY'S DATE: 6-15-05  
FIELD PERSONNEL: Colleen

[illegible]



# WELL SAMPLING DATA SHEET

PROJECT NAME: BLTP 2nd QMA 2005  
PROJECT NUMBER: 00142803 206  
WELL DESIGNATION: MW-12

PROJECT DATE: 6-16-05  
SAMPLER: Collector  
SAMPLE NUMBER: MW-12

## CONDITION OF WELL HEAD/VAULT/CAP & LOCK:

A. TOP OF CASING ELEVATION: \_\_\_\_\_  
B. DEPTH OF GROUNDWATER (initial): 8.0  
C. DEPTH OF WELL: \_\_\_\_\_ MEASURED 24.4  
D. HEIGHT OF WATER COLUMN (C-B): 16.4  
E. GROUNDWATER ELEVATION (A-B): \_\_\_\_\_

CASING DIAMETER: 2" ☒ 3" \_\_\_\_\_ 4" \_\_\_\_\_ OTHER: \_\_\_\_\_

CALCULATED WELL VOLUME:  $D \times V = 16.4 \times 0.163 = 2.67$   
Volume (V) of 2" well - 0.163 gal/ft  
Volume (V) of 4" well - 0.653 gal/ft

ODOR yes SHEEN yes FLOATING PRODUCT THICKNESS NO

PUMP TYPE: POLY BAILER ☒ STAINLESS BAILER \_\_\_\_\_  
ELECTRIC \_\_\_\_\_ OTHER \_\_\_\_\_

TIME	GALLONS PURGED	NO. OF WELL VOLUMES	PH	TEMPERATURE (°F or °C)	CONDUCTIVITY (mmhos/cm or µmhos/cm)	TURBIDITY (NTU or visual)
11:29	1	0.37	5.21	15.3	0.07	
11:32	3	1.12	5.36	15.2	0.08	
11:42	5	1.87	5.59	15.0	0.10	
11:47	6.0	2.25	5.63	15.1	0.10	
11:51	7.0	2.62	5.67	15.1	0.10	
11:54	8.00	2.99	5.67	15.1	0.09	
11:56	8.25	3.09	5.67	15.1	0.09	

RECHARGE RATE (qualitative): \_\_\_\_\_

SAMPLER TYPE: TEFLON BAILER \_\_\_\_\_ ACRYLIC BAILER \_\_\_\_\_ DISPOSABLE BAILER ☒

SAMPLES COLLECTED: 12:30  
PRESERVED VOA'S 3 UNPRESERVED VOA'S \_\_\_\_\_  
PRESERVED LITERS \_\_\_\_\_ UNPRESERVED LITERS \_\_\_\_\_  
500 ml PLASTIC BOTTLE WITH PRESERVATIVE FOR METALS:  
FILTERED \_\_\_\_\_ UNFILTERED \_\_\_\_\_  
OTHER \_\_\_\_\_

8.04  
COMMENTS: Well head covered in water, well cap tight.

# WELL SAMPLING DATA SHEET

PROJECT NAME: PLTP 2nd QMR2005  
PROJECT NUMBER: 00142803 204  
WELL DESIGNATION: MW-13

PROJECT DATE: 6-16-05  
SAMPLER: collar  
SAMPLE NUMBER: MW-13

## CONDITION OF WELL HEAD/VAULT/CAP & LOCK:

A. TOP OF CASING ELEVATION: \_\_\_\_\_  
B. DEPTH OF GROUNDWATER (initial): 9.42  
C. DEPTH OF WELL: \_\_\_\_\_ MEASURED 23.4  
D. HEIGHT OF WATER COLUMN (C-B): 14.98  
E. GROUNDWATER ELEVATION (A-B): \_\_\_\_\_

CASING DIAMETER: 2" ☒ 3" \_\_\_\_\_ 4" \_\_\_\_\_ OTHER: \_\_\_\_\_

CALCULATED WELL VOLUME:  $D \times V = 14.98 \times 0.163 = 2.44$   
Volume (V) of 2" well - 0.163 gal/ft  
Volume (V) of 4" well - 0.653 gal/ft

ODOR yes SHEEN NO

FLOATING PRODUCT THICKNESS NO

PUMP TYPE: POLY BAILER ☒  
ELECTRIC \_\_\_\_\_

STAINLESS BAILER \_\_\_\_\_  
OTHER \_\_\_\_\_

TIME	GALLONS PURGED	NO. OF WELL VOLUMES	PH	TEMPERATURE (°F or °C)	CONDUCTIVITY (mmhos/cm or µmhos/cm)	TURBIDITY (NTU or visual)
9:38	1	0.41	5.53	15.1	0.10	turbid
9:45	3	1.23	4.82	15.0	0.08	reddish brown
9:55	5	2.05	4.83	15.0	0.07	
10:05	6	2.56	4.85	15.1	0.07	
10:12	7	2.87	4.91	15.2	0.07	
10:15	7.25	2.97	4.92	15.2	0.07	
	7.5	3.07	4.92	15.2	0.07	

RECHARGE RATE (qualitative): \_\_\_\_\_

SAMPLER TYPE: TEFLON BAILER \_\_\_\_\_ ACRYLIC BAILER \_\_\_\_\_ DISPOSABLE BAILER ☒

SAMPLES COLLECTED: 12:15  
PRESERVED VOA'S 3 UNPRESERVED VOA'S \_\_\_\_\_  
PRESERVED LITERS \_\_\_\_\_ UNPRESERVED LITERS \_\_\_\_\_  
500 ml PLASTIC BOTTLE WITH PRESERVATIVE FOR METALS:  
FILTERED \_\_\_\_\_ UNFILTERED \_\_\_\_\_  
OTHER 0.47 \_\_\_\_\_

COMMENTS: all in good shape

# WELL SAMPLING DATA SHEET

PROJECT NAME: BLFP 2nd QMR 2005  
PROJECT NUMBER: 00142803-206  
WELL DESIGNATION: MW-11

PROJECT DATE: 6-15-05  
SAMPLER: Colleen  
SAMPLE NUMBER: MW-11

## CONDITION OF WELL HEAD/VAULT/CAP & LOCK:

A. TOP OF CASING ELEVATION: \_\_\_\_\_  
B. DEPTH OF GROUNDWATER (initial): 7.90  
C. DEPTH OF WELL: \_\_\_\_\_ MEASURED 25.0  
D. HEIGHT OF WATER COLUMN (C-B): 17.1  
E. GROUNDWATER ELEVATION (A-B): \_\_\_\_\_

CASING DIAMETER: 2" ☒ 3" \_\_\_\_\_ 4" \_\_\_\_\_ OTHER: \_\_\_\_\_

CALCULATED WELL VOLUME:  $D \times V = 17.1 \times 0.163 = 2.79$   
Volume (V) of 2" well - 0.163 gal/ft  
Volume (V) of 4" well - 0.653 gal/ft

ODOR NO SHEEN NO FLOATING PRODUCT THICKNESS \_\_\_\_\_

PUMP TYPE: POLY BAILER ☒ STAINLESS BAILER \_\_\_\_\_  
ELECTRIC \_\_\_\_\_ OTHER \_\_\_\_\_

TIME	GALLONS PURGED	NO. OF WELL VOLUMES	PH	TEMPERATURE (°F or °C)	CONDUCTIVITY (mmhos/cm or µmhos/cm)	TURBIDITY (NTU or visual)
4:12	1	0.36	5.34	16.4	0.08	Clear
4:18	3	1.08	5.38	16.2	0.08	turbid
4:24	5	1.79	5.38	16.1	0.07	reddish brown
4:31	7	2.51	5.31	16.2	stopped working	↓
4:40	8.00	2.87	5.33	16.1	↓	↓
4:44	8.25	2.96	5.30	16.1	↓	↓
	8.5	3.05	5.30	16.1	↓	↓

RECHARGE RATE (qualitative): \_\_\_\_\_

SAMPLER TYPE: TEFLON BAILER \_\_\_\_\_ ACRYLIC BAILER \_\_\_\_\_ DISPOSABLE BAILER ☒

SAMPLES COLLECTED: 5:29  
PRESERVED VOA'S 3 UNPRESERVED VOA'S \_\_\_\_\_  
PRESERVED LITERS \_\_\_\_\_ UNPRESERVED LITERS 1  
500 ml PLASTIC BOTTLE WITH PRESERVATIVE FOR METALS:  
FILTERED \_\_\_\_\_ UNFILTERED \_\_\_\_\_  
OTHER \_\_\_\_\_

COMMENTS: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**WELL SAMPLING DATA SHEET**

PROJECT NAME: BLFP 2<sup>nd</sup> QMR  
PROJECT NUMBER: 00142803-206  
WELL DESIGNATION: MW-14

PROJECT DATE: 6-15-05  
SAMPLER: Colleen  
SAMPLE NUMBER: MW-14

CONDITION OF WELL HEAD/VAULT/CAP & LOCK:

- A. TOP OF CASING ELEVATION: \_\_\_\_\_  
B. DEPTH OF GROUNDWATER (initial): 8.98  
C. DEPTH OF WELL: \_\_\_\_\_ MEASURED 25.2  
D. HEIGHT OF WATER COLUMN (C-B): 16.22  
E. GROUNDWATER ELEVATION (A-B): \_\_\_\_\_

CASING DIAMETER: 2" ☒ 3" \_\_\_\_\_ 4" \_\_\_\_\_ OTHER: \_\_\_\_\_

CALCULATED WELL VOLUME:  $D \times V = 16.22 \times 0.163 = 2.64$   
Volume (V) of 2" well - 0.163 gal/ft  
Volume (V) of 4" well - 0.653 gal/ft

ODOR NO SHEEN NO

FLOATING PRODUCT THICKNESS NO

PUMP TYPE: POLY BAILER ☒ ELECTRIC \_\_\_\_\_

STAINLESS BAILER \_\_\_\_\_ OTHER \_\_\_\_\_

TIME	GALLONS PURGED	NO. OF WELL VOLUMES	PH	TEMPERATURE (°F or °C)	CONDUCTIVITY (mmhos/cm or µmhos/cm)	TURBIDITY (NTU or visual)
3:24	1	0.38	6.00	15.7	0.25	clear
3:32	3	1.14	5.80	15.7	0.22	clear
3:37	5	1.89	5.84	15.7	0.23	turbid
3:49	7	2.65	5.30	15.7	0.23	greyish brown
3:55	7.5	2.84	5.40	16.0	0.23	
4:00	7.75	2.94	5.40	15.8	0.24	
4:05	8	3.03	5.39	15.8	0.24	

RECHARGE RATE (qualitative): \_\_\_\_\_

SAMPLER TYPE: TEFLON BAILER \_\_\_\_\_ ACRYLIC BAILER \_\_\_\_\_ DISPOSABLE BAILER ☒

SAMPLES COLLECTED: 5:01 PRESERVED VOA'S 3 UNPRESERVED VOA'S \_\_\_\_\_  
PRESERVED LITERS \_\_\_\_\_ UNPRESERVED LITERS 1  
500 ml PLASTIC BOTTLE WITH PRESERVATIVE FOR METALS:  
FILTERED \_\_\_\_\_ UNFILTERED \_\_\_\_\_  
OTHER \_\_\_\_\_

COMMENTS: cap and well are in good shape

8.98 8.91

